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(54) **AUTOMATED MEDICAL INFUSION DEVICE AND METHOD WITH IMPROVED ACCURACY AND SAFETY CHARACTERISTICS AND MRI-SAFE CAPABILITY**

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(57) **ABSTRACT**

A medical infusion device and related method of use for controlling the flow rate of a fluid into a patient's body, comprising: a tube for carrying fluid from a proximal end to a distal end thereof under the action of a driving pressure, which tube is flexible or has a flexible segment at some point along its length; a clamping element capable of preventing fluid flow by fully occluding a portion of the flexible tube or the flexible segment; a movable pusher element for acting variably against the clamping element to variably reduce the occlusion of the clamped portion of the flexible tube or flexible segment and thereby provide a controlled rate of fluid flow; two independently controllable electromechanically controlled actuator elements capable of moving variably over a prescribed range; and a mechanical linkage among the actuator elements, the pusher element and the clamping element.